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ABSTRACT

Two papers describe the roles of the Software Development Group (SDG) and the Software Review Center (SRC) at Drexel University. The first paper covers the primary role of the SDG, which is designed to assist Drexel faculty with the technical design and programming of courseware for the Apple Macintosh microcomputer; the relationship of the SDG professional to other members of development teams (usually a faculty member and a student programmer); types of courseware that were developed in the first 2 years of the program; and such tasks as serving as a communication link among projects, providing training for student programming staff, educating/informing faculty of available tools and techniques, archiving existing material, and developing and maintaining a software database of specialized modules to be used by other project teams. The purpose of the SRC is to enable faculty members to review existing software packages, thus making them better able to select quality software for purchase, or to make informed decisions as to appropriate and effective design strategies and techniques if they choose to design their own. This paper describes the software acquisition process, faculty usage of the SRC, and a number of legal issues raised by software licensing restrictions. Attachments include a list of SRC journals; request forms for acquisition of microcomputer software and long-term loan of microcomputing software; a general policy statement; and the SRC visitor register form. (THC)

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Software Development Group

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Software Development Group

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The primary role of the Software Development Group (SDG), formerly called Instructional Support Group, is to assist Drexel faculty with the technical design and programming of courseware for the Macintosh. A faculty member initiates the development process by submitting a proposal to the university Microcomputing Policy Committee (MPC). The proposal describes the content of the courseware to be designed, its pedagogical goals, and estimates of the resources required for the project. The MPC reviews and ranks all submitted proposals. Approval is based on the project's overall ranking as well as the availability of requested resources.

Faculty members may organize their projects as they desire; however, the most prevalent mode of organization is a team consisting of the faculty member, an SDG professional, and usually one student programmer. The team may also incorporate other interested faculty members, graduate students, or part-time undergraduate students. The faculty member serves as the "content specialist" and designs the flow of the courseware material. The SDG professional consults and advises the team on program design and user-interface issues, provides a bridge to material that already exists or is under development, provides programming and technical expertise regarding the flow of the program and applicable data structures, and programs difficult algorithms.

The student programmer (a full-time cooperative education student) generally implements the courseware design as specified by the faculty member and SDG professional. Incorporation of these student programmers into the design team has proven to be very beneficial to the process because: 1) the student frequently has more time and energy to devote to a project than anyone else on the design team; 2) the student is not limited by traditional boundaries and "what can't be done" and therefore occasionally produces very creative programming solutions; and 3) the student can represent the attitudes of the ultimate end-user of the courseware in a way none of the other team members can. In addition, if the faculty member encourages and fosters the student's participation, a wonderful synergism develops between the faculty member and the student regarding the content and presentation of the material.

Major management responsibility for the team resides either with the faculty developer or with the SDG professional, at the faculty member's discretion. Currently, almost all of the projects that require a full-time student programmer (more than half of current projects) are directly managed by SDG professionals. The SDG employs six full-time professionals, 15-18 full-time student programmers, 8-10 part-time personnel, and 5-8 graduate assistants; and approximately 30 active faculty projects are supported each term.

Courseware is sometimes developed with an individual faculty member accepting the entire responsibility for designing, implementing, and managing a project. In these cases, the SDG provides technical consultation when problems are encountered but ISG's direct contribution to these projects is minimal. However, when material does not meet certain minimum standards or in exhibiting technical difficulties, a more active participation by the SDG is generally encouraged by the Microcomputing Policy Committee. There are, of course, other development models in which a faculty member is allowed as much freedom as (s)he desires. In all cases, every funded proposal is

assigned an SDG professional contact and all faculty are encouraged to draw on SDG's consulting and technical expertise as needed.

Types of Courseware Developed

During the past two years, the Microcomputing Policy Committee has supported a variety of courseware development projects. These projects have represented every College in the University. Not surprisingly, the greatest number of projects have been proposed by the College of Science and the College of Engineering; however, there has been an unexpectedly high level of activity from the College of Humanities and Social Sciences and the College of Design Arts. The courseware material has been produced for lecture-demonstrations, standard drill and practice, experimental simulators, real-world simulators, adaptative/generic tools, and tools designed for a specific task.

Each of these types of materials has a niche in a university curriculum. In Drexel's environment, however, every student has his/her own microcomputer so there has been more development of software tools which the student can directly use at home or in the dormitory rather than development of material limited to use in a computer laboratory. In addition, the University has emphasized that every student should know how to use the computer, but not every student needs to know how to program. With this emphasis on the computer as a tool, traditional courseware models have been extended or modified and new ones are being developed.

Other Tasks

In addition to active support of individual faculty projects, the SDG also serves as the focal point for Macintosh-based application development. This includes serving as a communication link among projects, providing training for student programming staff, educating/informing faculty of available tools and techniques, archiving existing material, and developing and maintaining a software database of specialized modules which allows these modules to be used by other project teams. Through these activities and through active participation in faculty projects, the SDG assists in the cross-fertilization of techniques, methods, and concepts across departmental, college, and university boundaries. Since the current tools required to create Macintosh applications have long learning curves associated with them, a centralized support group with stable personnel who provide continuity as well as a foundation for training and consulting is desirable.

In support of the entire university community, the SDG also serves as the technical liaison with Apple Technical Support, tests new development tools and pre-release products (both in-house and commerical software and hardware), and evaluates commercial products (software and hardware) that the university is considering for purchase. Additionally, the SDG develops a variety of cross-disciplinary utilities and libraries that are needed for development. For example, a

general purpose plotting library has been developed and maintained by SDG. As an outgrowth of this plotting library, a basic, no-frills, scientific plotting application has also been developed. Drexel Plot allows the user either to directly enter data pairs or to select data from a Multiplan SYLK file and obtain a line plot of these data. Additional utilities that provide a debug facility, create graphical images and/or text resources from MacWrite or MacPaint files, protect source code, and animate (in cartoon fashion) a sequence of MacPaint images have been developed and maintained.

In addition to these basic utilities and applications, SDG developed and currently supports DU Talk - an enhanced version of Apple's telecommunications application, MacTerminal. This software includes all the features of MacTerminal but is also capable of emulating a Televideo 925, the most common terminal on the Drexel campus. DU Talk provides a complete telecommunciations package to the university community at no charge.

Currently, SDG is working on a micro-server system that will link a number of Macintoshes directly to Drexel's Prime mini-system. The micro-server, which has a Macintosh interface, allows a student to download files from the Prime to a Macintosh disk. The types of files currently supported include Drexel-produced applications (i.e., binary source), text files from any source, MacWrite data files, and MacPaint data files. Thus, faculty will be able to create data files and distribute them to individual students through a central facility. The micro-server also supports printing; for instance, files stored on the Prime, or MacWrite/MacPaint files stored on 3-1/2 diskettes can be printed with a line printer attached to the Prime. Dial-up capability allowing downloading files through a modem to a student's (or faculty member's) home is currently being developed.

Future Projects

The machine-rich environment that has been created through every student's individual Macintosh ownership has resulted in higher overall aspirations for computing on Drexel's campus and has consequently expanded the role of the Software Development Group. Naturally, SDG will continue to design and develop courseware material for the academic community. In addition, the SDG will be involved in the development of any Macintosh packages required to access/support a campus network which is currently being explored by the university. The need for micro-based software packages for different administrative components of the university has also become evident, and SDG, with its solid foundation in development, is prepared to support these projects as well. Furthermore, a few pilot projects have been initiated in which the Macintosh will be an intelligent link to either a mainframe or mini-computing system. Since these types of projects will require a marriage of software on the microcomputer to software on the mainframe computer or mini-computing system, the SDG will be supporting and developing these projects as they are identified and defined.

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Software Review Center

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Requests for copies of papers in the Microcomputing Working Paper Series should be sent to: Working Paper Series, Microcomputing Program, Office of the Vice President for Academic Affairs, Drexel University, Philadelphia, PA 19104.

Software Review Center

A Software Review Center was established at Drexel University during Summer, 1983. Financial support for this center is provided through a grant from the Pew Memorial Trust.

The purpose of this center is to enable faculty members to review existing software packages. It is hoped that through such review faculty will be better able to select quality software for purchase or, if they choose to design their own, to make informed decisions as to appropriate and effective design strategies and techniques. Faculty members may either examine the software within the center or check it out for review elsewhere. Apple IIe, IBM PC, and Macintosh computers are provided within the center for use in the examination of this software.

To date, approximately 200 software packages have been introduced into this collection. These packages are cataloged within the general University library collection. The complete listing of the center's holdings is updated monthly. Catalog number, title, hardware requirements, and keyword information is provided for each item. Searches and selected listings by hardware type, keyword, etc. can be prepared upon faculty request.

The actual software collection is supplemented by purchase of reports, books, and subscriptions to journals which are pertinent to software design and development. Print materials which are directly tied to specific software within the collection are kept with the associated software within the Software Review Center.

The bulk of the print collection, however, is integrated into the general collection within the main library of the University. A complete listing of these materials is available in both the Software Review Center and the main library. (As with the listing of software, searches and selected listings can be made upon faculty request.) In addition, current issues of approximately 30 journals relevant to microcomputing and/or software development are grouped together on a display rack in the browsing area of the main periodical room of the library. (See attachment, SRC Journals. Please note that some of these journals have already ceased publication.)

Software Acquisition Process

The criteria for selecting software for this collection are fairly broad. The funding for this center stipulates that the software acquired be "in support of the undergraduate curriculum." In practical terms, almost all faculty requests for software are honored if they are modest and seem to be appropriate (see below). More expensive packages are subject to review by the Microcomputing Policy Committee, a group comprised of six voting members (each representing one college of the University) and six non-voting members (senior members of the Microcomputing Program staff). No hardware requests are granted through funds allocated to the Software Review Center.

Most software requests are initiated by faculty members, but members of the Microcomputing Program staff may also make such requests. Product information, hardware requirements, and reason for acquisition must be provided as part of the request. (See attachment, Request for Acquisition of Microcomputing Software.) In some cases, faculty may request that

software be purchased for their own long-term personal use. (See attachment, Request for Long-Term Loan of Microcomputing Software.) Such requests may be honored if the software in question is considered to be appropriate to the center's collection.

Software request forms are sent to the Director of the Microcomputing Program. A member of the Director's staff checks the request to determine whether or not it should be sent for review by the Microcomputing Policy Committee. In some cases, a request is denied without committee review, e.g., the software in question bears absolutely no relation to the academic program or it is *generally* considered to be of little value. If the request is modest and seems to be both routine and acceptable, the request is initialed by the Director of the Microcomputing Program and sent to the Acquisition Department of the library for ordering. If the request is not routine, involves an expensive piece of software, or is being ordered for the long-term use of a specific individual, it is sent for committee review. If accepted, it is then sent to the Acquisition Department. Any faculty member whose request is denied receives a personal call to explain this decision. The faculty member at that time has an opportunity to appeal the decision.

When new software is received by the Acquisition Department, it is cataloged within the library collection by the Cataloging Department, then sent to the Software Review Center for shelving. For purposes of inventory control, all software purchased for the Software Review Center becomes part of the general library collection but is placed on extended loan to the Software Review Center.

Usage

Most software in the collection may be either used in the center or checked out for review elsewhere. The normal loan period is one week, but faculty may renew their loans if no one else has requested the package that they have checked out. (See attachment, General Policy for Software Review Center.) The vast majority of faculty using the Software Review Center prefer to check out software rather than review it within the center.

Some packages, however, cannot be taken out on loan. These are packages which bear a licensing restriction stating that the software must be used on one machine only. The University has, on occasion, written to the copyright holder to request a waiver on this restriction. Such requests have been granted, and, with written permission in hand, the University has allowed the programs in question to be taken out on loan. Without such a waiver, the University would, of course, respect the stipulations of the copyright holder.

As stated above, the Software Review Center was established as a resource for the Drexel University faculty. Guests of the University may also use this center by appointment, although they are not granted check-out privileges.

Students are not permitted to use this facility. Although their inclusion would certainly be desirable, resource limitations at this time make student inclusion impractical. (The center is now open to approximately 700 faculty members. If students were included, there would be 10,000 potential users.)

Furthermore, despite the fact that students could certainly profit from use of this facility, there are a number of legal issues which are of concern to the University in relation to the existing facility which need to be resolved before similar access to software is provided to more individuals. This is not to imply that the legal issues relate only to student use. Rather, they apply to all users of the center, and until these issues are adequately resolved, the University will not open the facility to more widespread use.

Legals Issues

Software licensing restrictions raise a number of legal issues in relation to operation of a Software Review Center. One, as mentioned above, has to do with the "one machine" restriction. In addition, some packages limit use to "one user." Although this restriction probably wouldn't hold up in court,[1] it still may raise some potential problems. And finally, the possibility of illegal copying of software on loan from the center is of great concern to the University.

Current law seems quite clear in stating that the original purchaser is responsible for all illegal copies made from a given piece of software. It is very important, therefore, to make clear to anyone using the center or borrowing software from its collection that no copies are to be made. To this end, all users of the center must sign in on a sheet that reminds them they may not use the center's facilities to copy any "proprietary" software. (See attachment, SRC Visitor Register.)

The entire issue of legal and ethical use of software is, of course, primarily one of educating users. This must be an on-going process. What's more, it is a difficult one in that so many veteran computer users are accustomed to sharing software without regard to licensing restrictions, and these veteran users tend to be the ones to whom new users look for guidance. (For a discussion of some of the steps Drexel University is taking in this area, see "Computer and Software Abuse Policies," A 84-7 in this same working paper series.) Until such time as these issues are resolved, or at least better understood, the Software Review Center will continue to run under the restrictions listed above.

1 A number of articles have recently appeared which review software licensing restrictions. One of the most comprehensive is Richard A. Baker, "Of Copyrights and Databases" in *Microcomputing 1* (August 1984): 34-39.

Attachments

SRC Journals

Request for Acquisition of Microcomputing Software

Request for Long-Term Loan of Microcomputing Software

General Policy for Software Review Center

SRC Visitor Register

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SRC Journals

General

Hardware Specific

A+ (Apple II & Mac families)
Apple Orchard (whole Apple line)
Call A.P.P.L.E. (Puget Sound Users Group)
Club Mac News
Iconcepts (Macintosh)
Macazine
MacTutor
MacWorld
Nibble (Apple)
PC Magazine (IBM PC)
PC Tech Journal (IBM PC)

Casual User

Computer Book Review
Computer Contents
Computer Literature Index
Computer Update (Boston Computer Society)
InfoWorld
Personal Computing
Software Reports
Software Reviews on File
Whole Earth Software Review

Serious User

Bulletin Board Systems
Byte
Information Technology Newsletter
Micro

Special Topic

Computer Science

Computer Lnaguages
Computer Personnel Research Conference
Microcomputing

SRC Journals
(continued)

Language/Literature/Composition
- CALICO Journal
- Computers and Composition
- Computers and the Humanities

Elementary/Secondary Education
- Classroom Computer Learning
- Computer Education
- Computers in the Schools
- Educational Micro Review
- National Logo Exchange

General University
- Collegiate Microcomputer
- Computers and Education
- Digest of Software Reviews
- Library Software Review
- Software Review
- T.H.E. Journal
- Telescan

Mathematics/Science
- Journal of Computers in Mathematics and Science Teaching

Legal
- Computer Lawyer

Design/Architecture
- Computers for Design and Construction

Business
- Business Computer Systems
- Computing for Business
- Computing Newsletter for Schools of Business
- Interface Age
- Small Business Computers
- Small Systems World

Engineering
- Engineering Software Exchange

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Request for Acquisition of Microcomputing Software

Requested by _____

Department _____

Name of Product _____

Supplier _____

Address (if known) _____

_____

Phone (if known) _____

List price _____

PLEASE ATTACH ANY AVAILABLE INFORMATION ON THIS PRODUCT.

Reason for acquisition _____

_____

_____

_____

_____

Hardware required _____

RETURN THIS FORM TO: Brian Hawkins, Director, Microcomputing Program

Request for Long-Term Loan of Microcomputing Software

Requested by _____

Department _____

Name of Product_____

Reason for loan _____

_____

_____

_____

_____

Estimated length of loan_____

Hardware required_____

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If requested software is not already in collection of the Software Review Center, please provide the following information. (To verify SRC holdings, call x1877)

Supplier_____

Address (if known)_____

_____

Phone (if known)_____

List price _____

PLEASE ATTACH ANY AVAILABLE INFORMATION ON THIS PRODUCT.

RETURN THIS FORM TO: Brian Hawkins, Director, Microcomputing Program

General Policy for Software Review Center

Because the general purpose of the Software Review Center (SRC) is to provide the Drexel faculty an opportunity to review educational software that is available on a variety of microcomputers, it is essential that most of the software be available for immediate review. However, it is also understood that it is not always possible to adequately review software in a short time period so a procedure for checking out software has been implemented. It is hoped that this procedure is generous enough to allow maximum utilization of software to individual faculty while not infringing on the service to the community as a whole.

1. Items may be checked out for a 7-day period with three renewals permitted. Renewal is permitted via the phone by calling the Software Review Center (X1877). At the end of the third week the borrower will be notified by phone that no further renewals will be permitted without written permission from Brian Hawkins, Assistant VPAA and Head of the Microcomputer Project. At the end of the fourth week, the borrower will receive the first mail notice (see attached OVERDUE NOTICE). At the end of the fifth week (and subsequent weeks), the borrower will receive another mail overdue notice with a informational copy also being sent to the Head of Microcomputer Project (see attached Notification Procedure).

2. After the borrower has retained software for a period of 7 days or greater, request for material by another borrower automatically excludes any additional renewals. If borrower does not return requested material, the borrower will receive a mail overdue notice with an informational copy also being sent to the Head of Microcomputer Project.

3. If the borrower anticipates in advance a need for an extended loan, they should immediately apply to the Head of the Microcomputer Project for such an extension. Application for an extension should be in writing and identify the software and how it fits into the borrower's specific curriculum and why it's absence from the Software Review Center would not affect the community at large. If the borrower does not anticipate in advance the need for an extended loan, they will continue to receive written notices until permission is granted for an extended loan.

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SRC Visitor Register

Date	Name	Please place a check below your primary reason for visiting the SRC								
		Time IN	Time OUT	Aca-demic DEPT.	Review Soft-ware	Lisa Office System / Workshop	Lisa Develop System	Apple IIe	IBM PC	Mac
	"(see agreement below)"									
	"(see agreement below)"									
	"(see agreement below)"									
	"(see agreement below)"									
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	"(see agreement below)"									

Agreement

I agree that I will not use Software Review Center equipment or materials to make any copies of proprietary software.